

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A fabrication method of a liquid crystal display device, comprising:

providing a substrate;

forming a metal layer on the substrate;

forming a gate photoresist pattern on the metal layer by a first roller printing process;

etching the metal layer using the gate photoresist pattern as a mask to form a gate line;

removing the gate photoresist pattern;

sequentially forming a gate insulating layer, a semiconductor layer, and a high-concentrated N⁺ layer over the substrate and the gate line;

forming an active photoresist pattern on the high-concentrated N⁺ layer by a second roller printing process;

sequentially etching the high-concentrated N⁺ layer and the semiconductor layer using the active photoresist pattern as a mask to form a semiconductor layer pattern and a high-concentrated N⁺ layer pattern, wherein an active region comprises the semiconductor layer pattern and the high-concentrated N⁺ layer pattern;

removing the active photoresist pattern;

forming a conductive layer over the active region and the gate insulating layer;

depositing a photoresist layer over the conductive layer;

applying a mask over the photoresist layer, and performing a lithography process, to form a photoresist layer pattern;

removing the conductive layer by using the photoresist layer pattern as a mask to form source and drain electrodes;

removing the high-concentrated N⁺ layer pattern above a channel region by using the photoresist layer pattern as a mask, such that the channel region of the semiconductor layer pattern is exposed;

removing the photoresist layer pattern;

forming a passivation layer over the substrate and the source and drain electrodes;

forming a contact hole photoresist pattern over the passivation layer by a third roller printing process;

removing the passivation layer by using the contact hole photoresist pattern as a mask to form a contact hole exposing the drain electrode;

removing the contact hole photoresist pattern;

forming a pixel electrode layer over the passivation layer and the contact hole;

forming a pixel electrode photoresist pattern over the pixel electrode layer by a fourth roller printing process; and

removing the pixel electrode layer by using the pixel electrode photoresist pattern as a mask to form a pixel electrode electrically connected with the drain electrode,

wherein a plurality of alignment marks are simultaneously formed at the time of the roller printing process.

~~wherein each of the first to fourth roller printing processes comprises,~~

~~providing a cliché having an intaglio pattern of a groove form;~~

~~depositing a predetermining amount of photoresist on the cliché;~~

~~rotating a roller on the cliché to transfer the photoresist contained in the cliché
onto a surface the roller; and~~

~~rotating the roller on the substrate to re-transfer the photoresist contained in
the roller onto the substrate thereby forming a photoresist pattern on the substrate.~~

Claims 2-14 (Cancelled)

15. (Currently Amended) The method of claim 1, wherein the mask applied over the photoresist layer in the step of applying the mask is the only mask applied ~~through-out~~ throughout the method of claim 1.

Claims 16-23 (Cancelled)

24. (Currently Amended) A fabrication method of a liquid crystal display device, comprising:

forming a metal layer on a substrate;

forming a gate photoresist pattern on the metal layer by a first roller printing process, wherein the first roller printing process comprises providing a cliché on which the gate photoresist pattern ~~a resist~~ is deposited[[,]]; contacting a roller with the cliché in which the gate photoresist pattern ~~the resist~~ is contained[[,]]; rotating a roller on the cliché, to transfer the gate photoresist pattern ~~the resist~~ contained in the cliché onto a surface of the roller[[,]]; and contacting the roller with the metal layer on the substrate and rotating on the substrate to

retransfer the gate photoresist pattern ~~the resist~~ onto the surface of the roller to form the gate photoresist pattern on the metal layer;

etching the metal layer using the gate photoresist pattern as a mask to form a gate line,
removing the gate photoresist pattern;

sequentially forming a gate insulating layer, a semiconductor layer, and a high-concentrated N⁺ layer over the substrate including the gate line;

forming an active photoresist pattern on the high-concentrated N⁺ layer by a second roller printing process, wherein the second roller printing process comprises providing a cliché on which an active photoresist pattern is deposited; contacting a roller with the cliché in which the active photoresist pattern is contained; rotating a roller on the cliché, to transfer the active photoresist contained in the cliché onto a surface of the roller; and contacting the roller with the high-concentrated N⁺ layer on the substrate and rotating on the substrate to retransfer the active photoresist pattern onto the surface of the roller to form the active photoresist pattern on the high-concentrated N⁺ layer;

etching the high-concentrated N⁺ layer and the semiconductor layer using the active photoresist pattern as a mask to form a semiconductor layer pattern and a high-concentrated N⁺ layer pattern defined as an active region ~~an active region including the semiconductor layer and the high-concentrated N⁺ layer, wherein the active region is formed by sequentially removing the high-concentrated N⁺ layer and the semiconductor layer;~~

removing the active photoresist pattern;

forming a conductive layer over the substrate including the high-concentrated N⁺ layer pattern and the semiconductor layer pattern;

forming a photoresist layer on the conductive layer;

patterning the photoresist layer by performing a lithography process to form a photoresist layer pattern;

removing the conductive layer ~~and the high-concentrated N+ layer on a channel region~~ by the photoresist layer pattern as a mask to form source and drain electrodes electrically separated from each other, wherein when the source/drain electrodes are formed, a data line and a storage electrode are formed simultaneously by the mask process, and wherein the conductive layer is removed by a wet etch process;

removing the high-concentrated N+ layer pattern on a channel region of the semiconductor layer pattern, wherein the high-concentrated N+ layer pattern is removed by a dry etch process;

removing the photoresist layer pattern;

forming a passivation layer over the source and drain electrodes ~~by a roller printing process;~~

forming a contact hole photoresist pattern on the passivation layer by a third roller printing process, wherein the third roller printing process comprises providing a cliché on which a contact hole photoresist pattern is deposited; contacting a roller with the cliché in which the contact hole photoresist pattern is contained; rotating a roller on the cliché, to transfer the contact hole photoresist contained in the cliché onto a surface of the roller; and contacting the roller with the passivation layer on the substrate and rotating on the substrate to retransfer the contact hole photoresist pattern onto the surface of the roller to form the contact hole photoresist pattern on the passivation layer;

etching the passivation layer by using the contact hole photoresist pattern as a mask to form a contact hole;

removing the contact hole photoresist pattern;

forming a transparent electrode layer over the passivation layer and the contact hole;

forming a pixel electrode photoresist pattern over the pixel electrode layer by a fourth roller printing process, wherein the fourth roller printing process comprises providing a cliché on which a pixel electrode photoresist pattern is deposited; contacting a roller with the cliché in which the pixel electrode photoresist pattern is contained; rotating a roller on the cliché, to transfer the pixel electrode photoresist contained in the cliché onto a surface of the roller; and contacting the roller with the passivation layer on the substrate and rotating on the substrate to retransfer the pixel electrode photoresist pattern onto the surface of the roller to form the pixel electrode photoresist pattern on the passivation layer; and

removing the transparent electrode layer by using the pixel electrode photoresist pattern as a mask to form a pixel electrode electrically connected with the drain electrode, wherein a plurality of alignment marks are simultaneously formed at the time of the roller printing process.

25. (New) The method of claim 24, wherein the mask applied over the photoresist layer in the step of applying the mask, is the only mask applied throughout the method of claim 24.

26. (New) The method of claim 1, wherein the conductive layer is removed by a wet etch process, and the high-concentrated N⁺ layer pattern is removed by a dry etch process.

27. (New) The method of claim 1, wherein the each of the first to fourth roller printing processes comprises,

providing a cliché having an intaglio pattern of a groove form;
depositing a predetermining amount of photoresist on the cliché;
rotating a roller on the cliché to transfer the photoresist contained in the cliché onto a surface the roller; and
rotating the roller on the substrate to re-transfer the photoresist contained in the roller onto the substrate, thereby forming a photoresist pattern on the substrate.

28. (New) The method of claim 1, wherein the photoresist in the first to fourth roller printing processes is one of the gate, active, contact hole and pixel electrode photoreist patterns.

29. (New) The method of claim 1, wherein the plurality of alignment marks are formed at the time of the first roller printing process, to correctly dispose each pattern to each alignment mark at the time of transferring and to prevent an inconsistency between the patterns generated at the time of aligning the patterns.

30. (New) The method of claim 1, wherein the forming of the plurality of alignment marks are formed at the time of the first to fourth roller printing processes, to correctly dispose each pattern to each alignment mark at the time of transferring and to prevent an inconsistency between the patterns generated at the time of aligning the patterns.

31. (New) The method of claim 24, wherein the plurality of alignment marks are formed at the time of the first roller printing process, to correctly dispose each pattern to each alignment

mark at the time of transferring and to prevent an inconsistency between the patterns generated at the time of aligning the patterns.

32. (New) The method of claim 24, wherein the plurality of alignment marks are formed at the time of the first to fourth roller printing processes, to correctly dispose each pattern to each alignment mark at the time of transferring and to prevent an inconsistency between the patterns generated at the time of aligning the patterns.